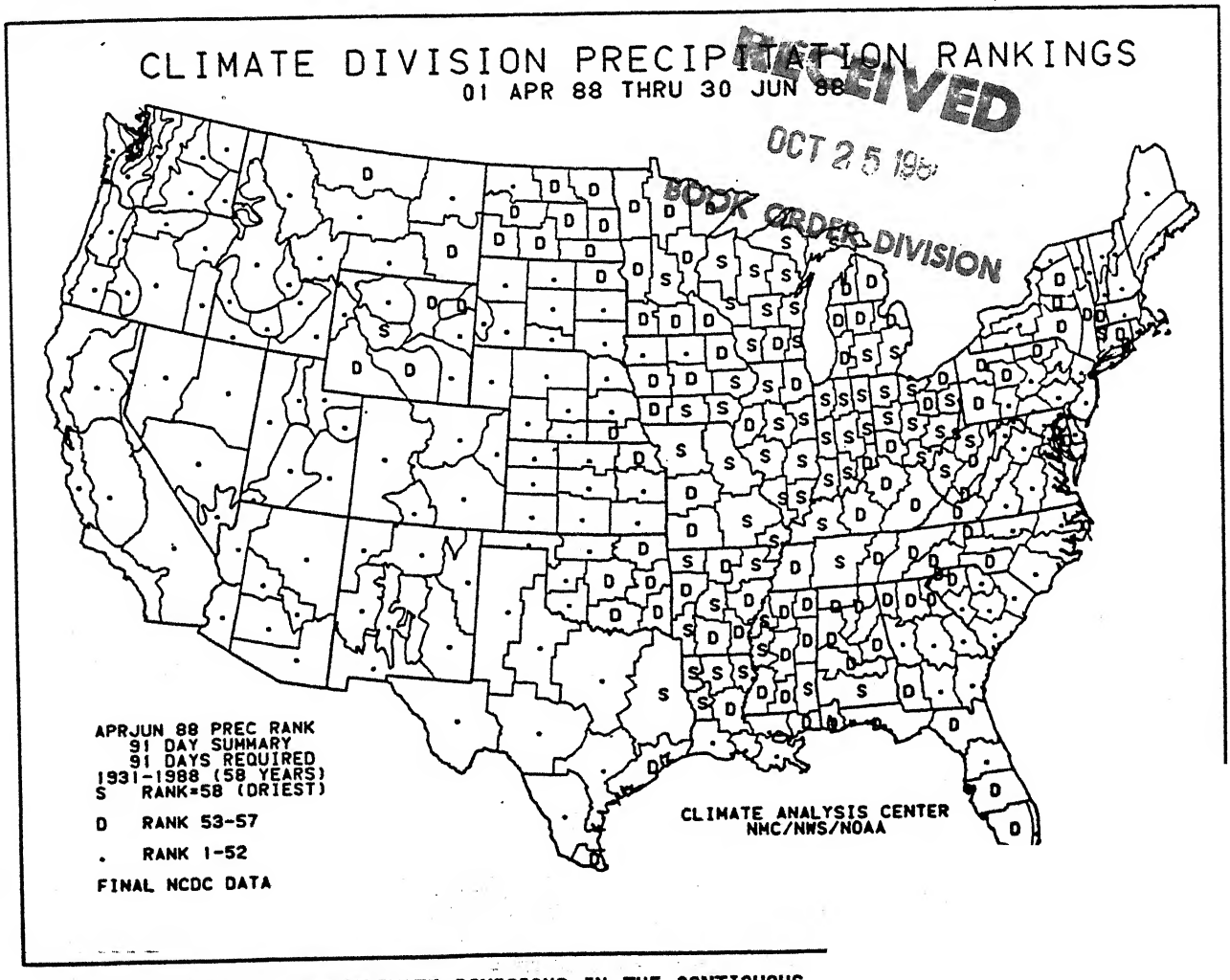
CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

No. 88/39 Washington, DC September 24, 1988



62 (104) OF THE 344 CLIMATE DIVISIONS IN THE CONTIGUOUS
DRIEST (SECOND-FIFTH DRIEST) APRIL-JUNE ON RECORD DURIN.
1931) BASED UPON THE FINAL NATIONAL CLIMATIC DATA
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UNITED STATES DEPARTMENT OF
NATIONAL OCEANIC AND ATMOSPHERIC ADMIN.
NATIONAL WEATHER SERVICE - NATIONAL METEOROLO

WEEKLY CLIMATE BULLETIN

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This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief, concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

Highlights of major global climatic events and anomalies.
U.S. climatic conditions for the previous week.
U.S. apparent temperatures (summer) or wind chill (winter).
Global two-week temperature anomalies.
Global four-week precipitation anomalies.
Global monthly temperature and precipitation anomalies.
Global three-month precipitation anomalies (once a month).
Global twelve-month precipitation anomalies (every 3 months).
Global temperature anomalies for winter and summer seasons.
Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Center via the Global Telecommunication System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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Climate Analysis Center, W/NMC53
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NOAA, National Weather Service
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GLOBAL HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF SEPTEMBER 24, 1988
(Approximate duration of anomalies is in brackets.)

1. North Central United States:
PRECIPITATION BRINGS SOME RELIEF FROM DRYNESS.
As much as 124.5 mm (4.90 inches) of precipitation fell in parts of Montana and the Dakotas; however, long-term precipitation deficits still exist. See U.S. Weekly Weather Highlights [28 weeks].

2. United States:
GILBERT ENHANCES MIDWEST PRECIPITATION.
Heavy rains, up to 160.0 mm (6.30 inches), from the remnants of Hurricane Gilbert, fell along a swath from Texas northeastward to the lower Great Lakes. See U.S. Weekly Weather Highlights [Episodal Event].

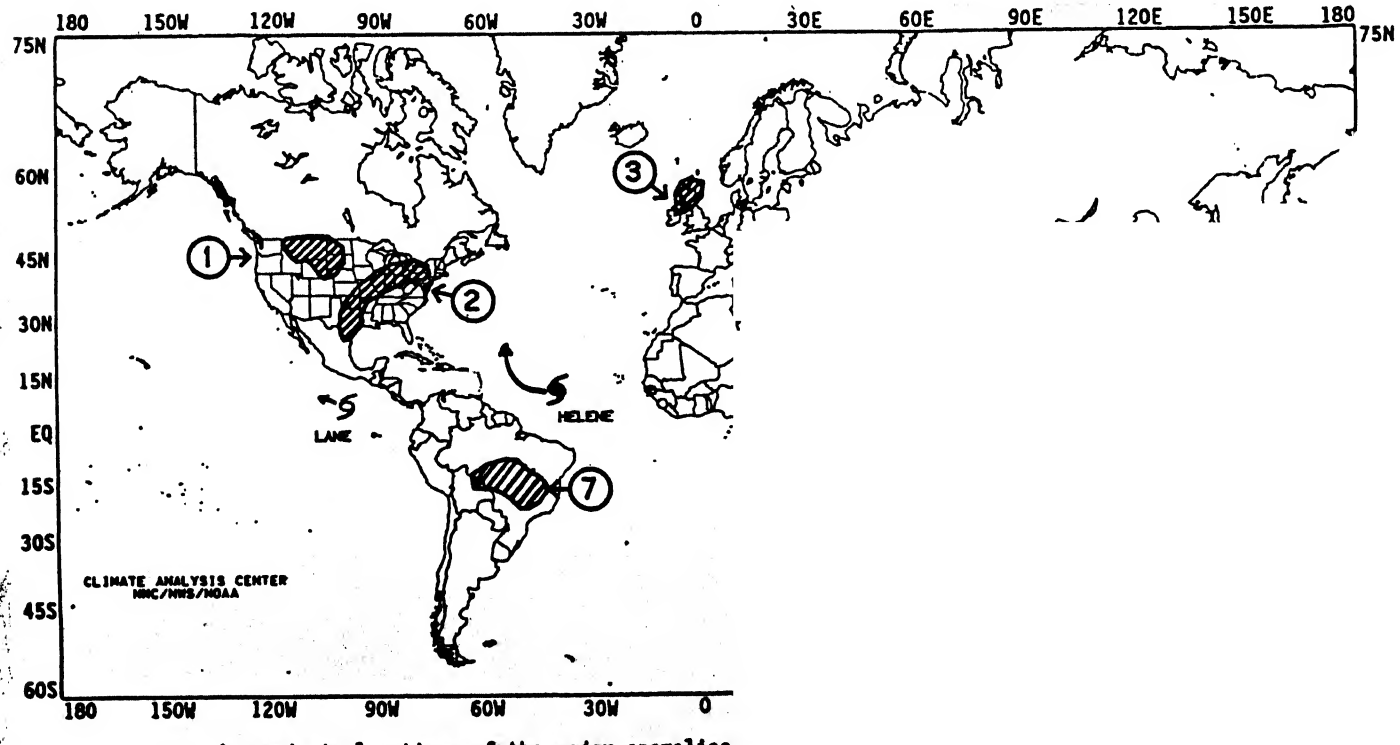
3. Scotland:
WET WEATHER EASES.
Light rain, generally less than 11.6 mm (0.46 inches), was reported by many stations in Scotland as wet conditions diminished [Ended at 11 weeks].

4. China and Taiwan:
REGION REMAINS WET.
As much as 561.4 mm (22.1 inches) of rain fell at stations in central and eastern China and Taiwan [8 weeks].

5. India:
HEAT WAVE ENDS.
Temperatures fell to near or below normal levels and brought relief from the prolonged heat wave [Ended at 3 weeks].

6. Thailand:
HEAVY RAINS REPORTED.
Up to 443.0 mm (17.44 inches) of rain occurred at stations in western Thailand [Episodal Event].

7. Brazil and Bolivia:
AREA UNUSUALLY DRY.
Generally less than 11 mm (0.43 inch) of precipitation was reported by stations across much of central Brazil and northeastern Bolivia [13 weeks].



Approximate locations of the major anomalies this map. See other maps in this Bulletin fo four week precipitation anomalies, longer te

U.S. WEEKLY WEATHER HIGHLIGHTS

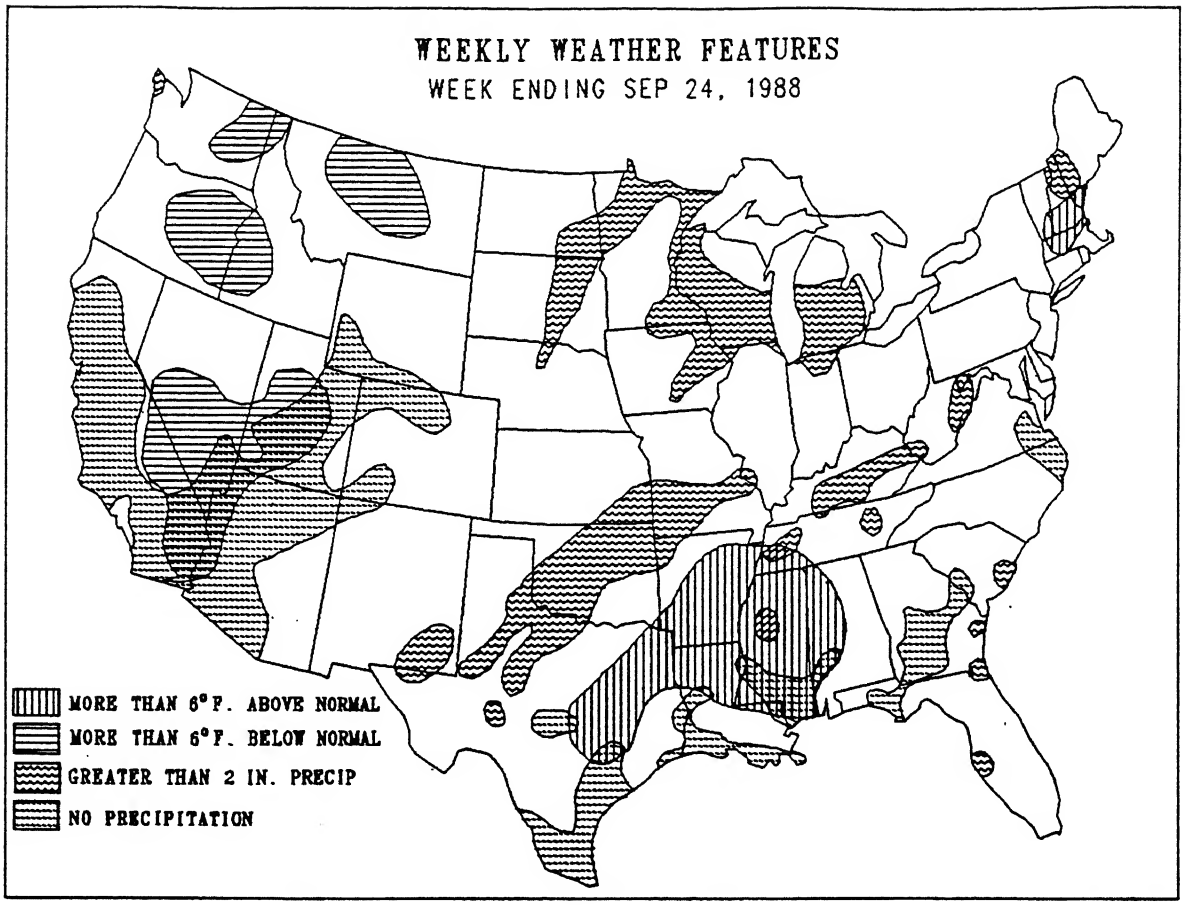
FOR THE WEEK OF SEPTEMBER 18 THROUGH SEPTEMBER 24, 1988.

Portions of the northern Great Plains, upper Midwest, and western Great Lakes regions received heavy precipitation in association with strong thunderstorms that preceded cold fronts early and late in the week. In addition to the 2-4 inches of rainfall that occurred in the eastern Dakotas and the northern halves of Minnesota and Wisconsin, the remnants of Gilbert enhanced convective activity in eastern Iowa, southern Wisconsin, and lower Michigan as the area recorded between 4 and 6 inches of precipitation (see Figure 1). Farther south, as moisture from the remains of Gilbert raced northeastward from southwestern Texas, most of western Texas, central Oklahoma, southeastern Kansas, southern Missouri, and northern Arkansas experienced moderate to heavy rains (up to 6.3 inches in southeastern Kansas) (see Figure 2). Elsewhere, heavy precipitation totals were measured in parts of the Pacific Northwest, eastern New Mexico, central Florida, central North Carolina, from western Tennessee northeastward into central West Virginia, and in southeastern Alaska (see Table 1). Light to moderate precipitation amounts were observed in much of the Pacific Northwest, the northern thirds of the Rockies and Great Plains, in eastern areas of the Great Basin, the southern Rockies, and throughout most of the eastern half of the nation except for scattered sections of the Gulf Coast and the Southeast. Little or no precipitation fell on the southern thirds of the Pacific Coast and Intermountain Region, the central Rockies, along the western Gulf Coast, and from the Florida Panhandle northeastward to South Carolina.

Above normal temperatures persisted in the nation's midsection for the second consecutive week as warmer weather covered most of the U.S. east of the Rockies. The greatest departures above normal (between +6 and +9°F) were found from central Texas eastward to central Alabama and in central New England (see Table 2). Highs equaled or surpassed 90°F at least once last week as far north as the central Great Plains, lower Midwest, and mid-Atlantic regions, while readings in the hundreds were confined to the desert Southwest (see Figure 3). Cooler weather continued for the second straight week throughout the western third of the country and in the northern Great Plains as temperatures averaged 6-9°F below normal from southern California and western Arizona northward into Idaho and Montana (see Table 3). Lows dipped below freezing at least once last week in most of the Great Basin and the northern and central Rockies, while a few stations in northern Nevada and western Wyoming reported readings in the teens (see Figure 4). Another week of moderate precipitation and below normal temnperatures have continued to improve conditions for the containment and extinguishment of wildfires in the northern Rockies.

TABLE 1. Selected stations with two and one-half inches or more of precipitation for the week.

Cordova, AK	6.31	Fayetteville, AR	3.14
Joplin, MO	5.49	Duluth, MN	3.12
Grand Rapids, MI	5.15	Greenwood, MS	3.08
Oklahoma City/Tinker AFB, OK	5.00	Milwaukee, WI	3.04
Carlsbad, NM	4.64	Mason City, IA	3.00
Aberdeen, SD	4.61	Tulsa, OK	3.00
La Crosse, WI	4.50	Quillayute, WA	2.93
Muskegon, MI	4.33	Chanute, KS	2.89
Springfield, MO	4.30	Rochester, MN	2.87
Mt. Washington, NH	4.23	Cold Bay, AK	2.81
Ft. Sill/Henry Post, OK	3.81	International Falls, MN	2.80
Altus AFB, OK	3.79	Ft. Smith, AR	2.78
Bowling Green, KY	3.76	Eau Claire, WI	2.75
Yakutat, AK	3.61	Talkeetna, AK	2.66
Valdez, AK	3.59	Jacksonville, FL	2.60
Lansing, MI	3.37	Huron, SD	2.54
Memphis NAS, TN	3.19	Jackson, KY	2.50



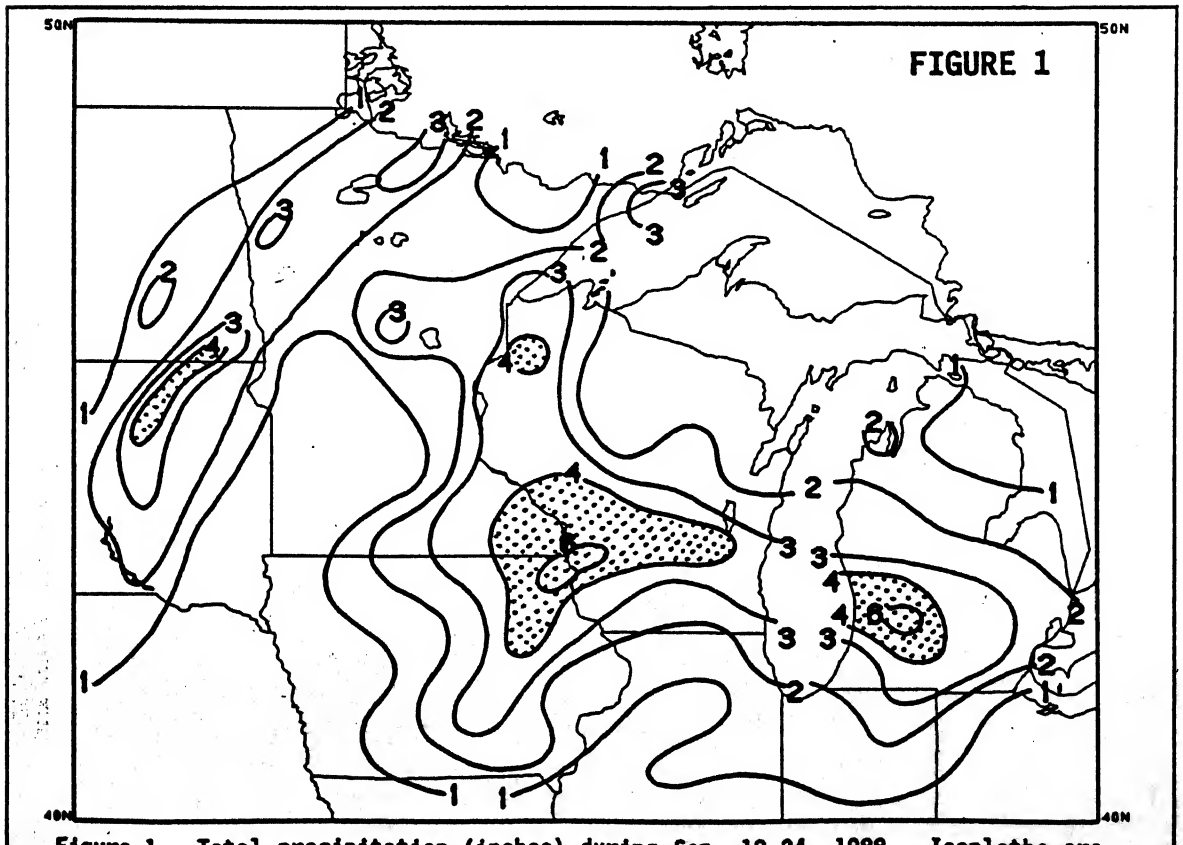


Figure 1. Total precipitation (inches) during Sep. 18-24, 1988. Isopleths are drawn for only 1, 2, 3, 4, and 6 inches, and stippled areas are more than 4 inches. Severe thunderstorms preceding cold fronts early and late in the week dropped heavy rains on portions of the northern Great Plains and Midwest.

TABLE 2. Selected stations with temperatures averaging greater than 5°F ABOVE normal for the week.

Station	TDepNml	AvgT(°F)	Station	TDepNml	AvgT(°F)
Greenwood, MS	+8	82	Hartford, CT	+7	68
Monroe, LA	+8	82	Houston, TX	+6	84
Memphis, TN	+8	80	Austin, TX	+6	84
Waco, TX	+7	84	Baton Rouge, LA	+6	83
Biloxi/Keesler AFB, MS	+7	84	Lafayette, LA	+6	83
Austin/Bergstrom AFB, TX	+7	84	Dallas/Ft. Worth, TX	+6	82
College Station, TX	+7	84	Birmingham, AL	+6	78
Shreveport, LA	+7	83	Muscle Shoals, AL	+6	77
Alexandria/England AFB,LA	+7	83	Islip, NY	+6	68
Jackson, MS	+7	82	Albany, NY	+6	65
Meridian, MS	+7	81	Concord, NH	+6	63
Tuscaloosa, AL	+7	81	Massena, NY	+6	63
Little Rock, AR	+7	79	Lebanon, NH	+6	62

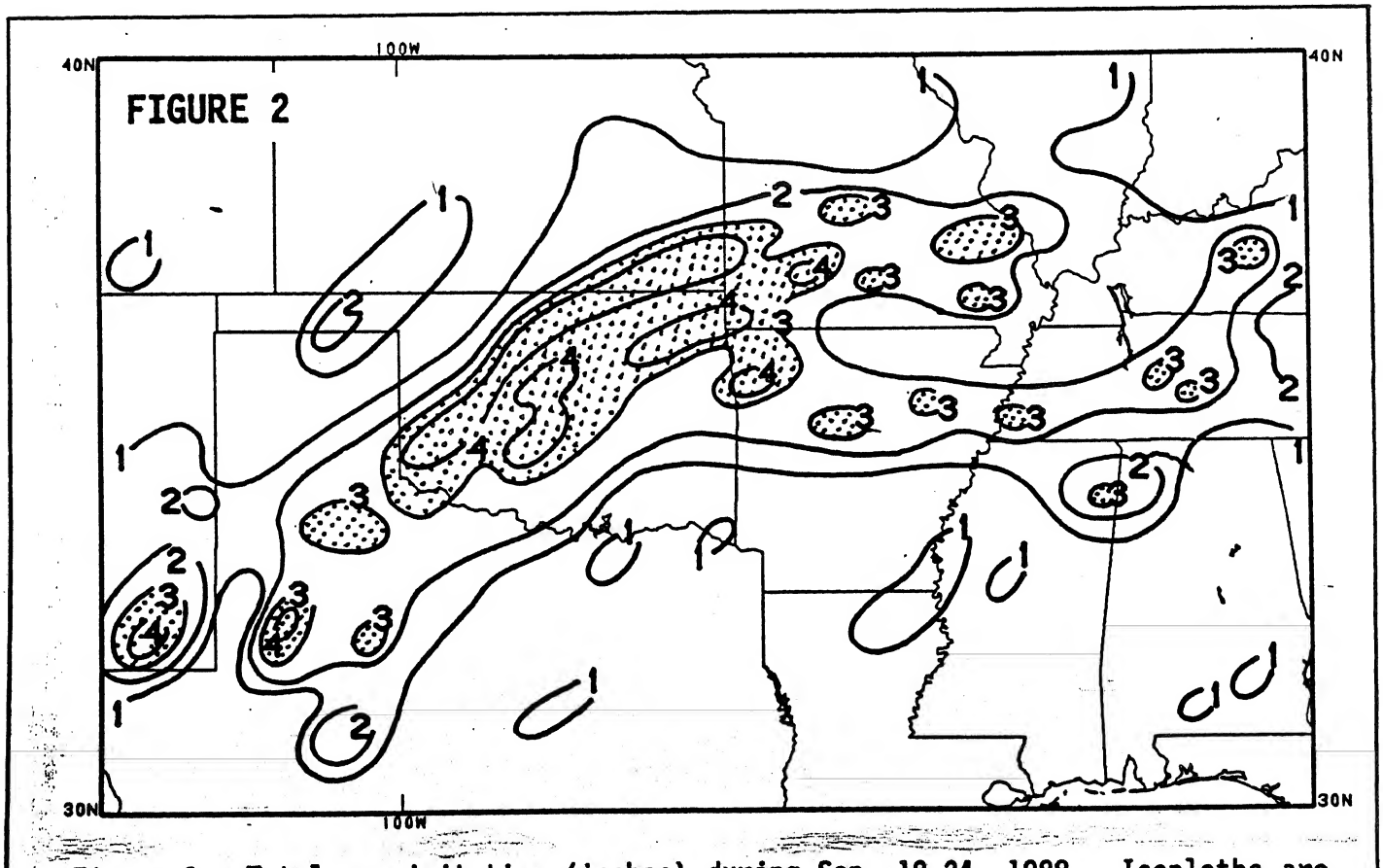


Figure 2. Total precipitation (inches) during Sep. 18-24, 1988. Isopleths are drawn for only 1, 2, 3, and 4 inches, and stippled areas are greater than 3 inches. Remnants from Hurricane Gilbert dumped between 2 and 4 inches of rain on parts of the central Great Plains.

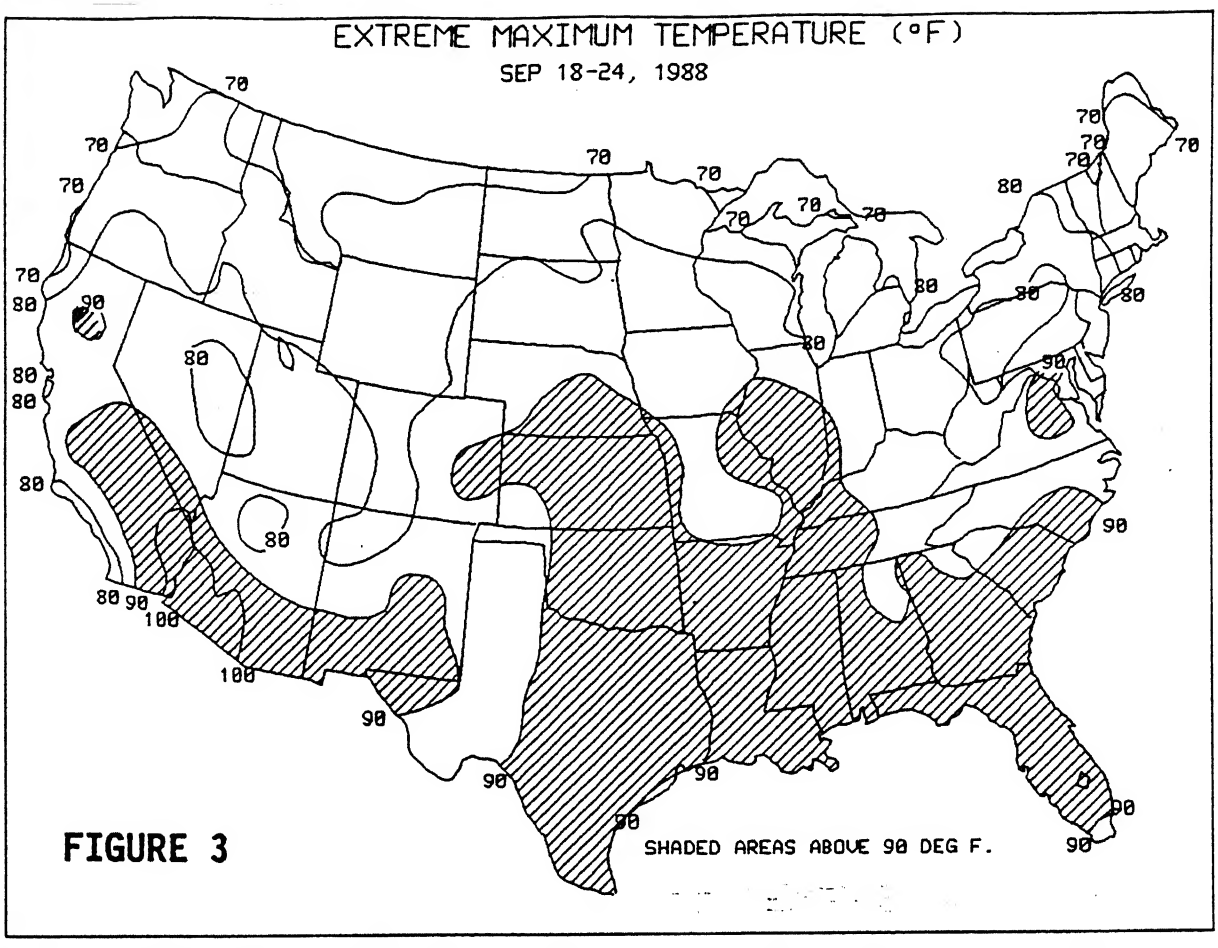


FIGURE 3

Highs surpassed the 90°F mark at least once last week in most of the southern half of the nation (top), while daily maximum temperatures AVERAGED in the nineties along the Gulf Coast and in the desert Southwest (bottom).

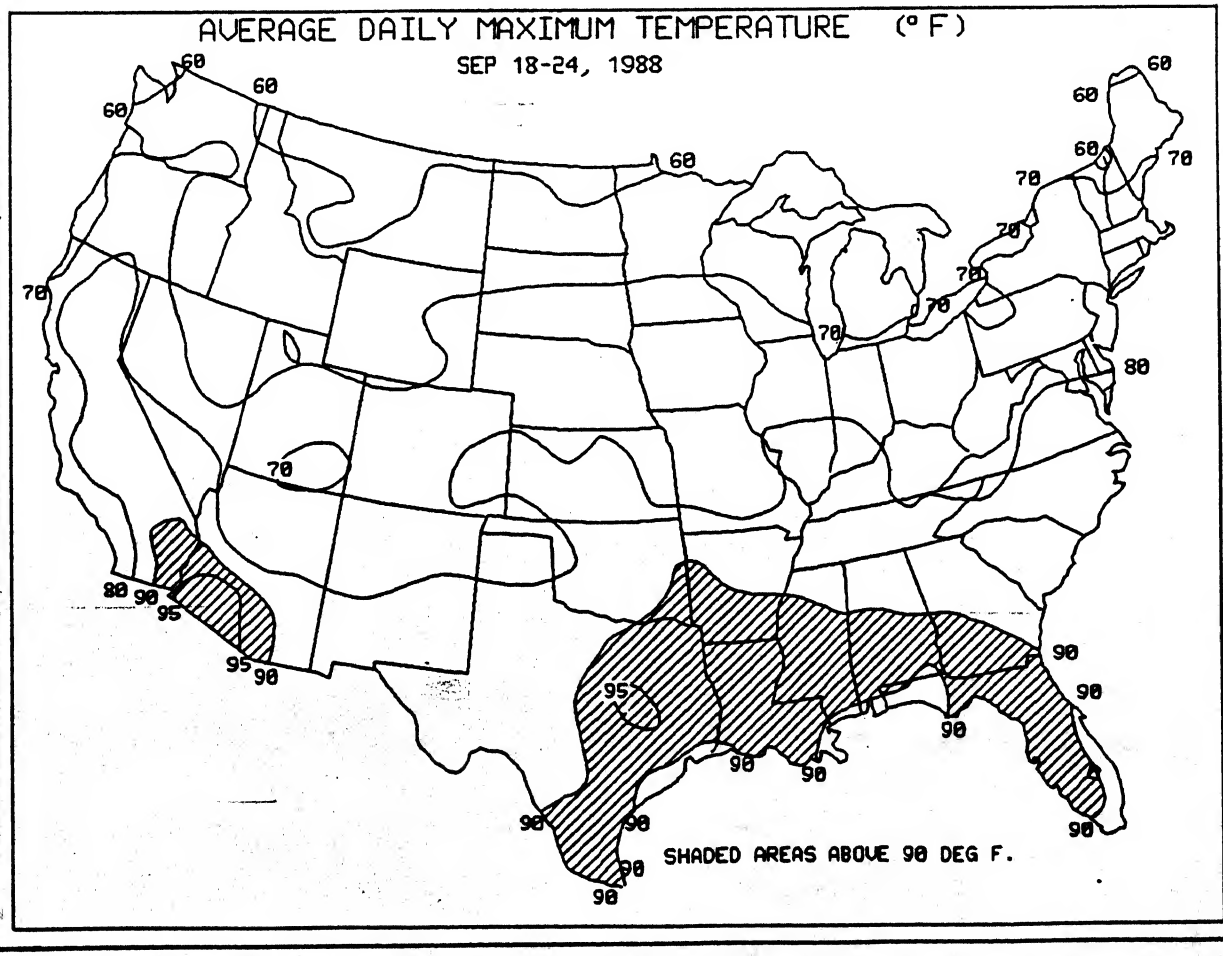


TABLE 3. Selected stations with temperatures averaging greater than 4°F BELOW normal for the week.

Station	TDepNml	AvgT(°F)	Station	TDepNml	AvgT(°F)
Burns, OR	-9	48	Kalispell, MT	-5	47
Great Falls, MT	-8	47	Williston, ND	-5	49
Imperial, CA	-8	77	Ely, NV	-5	50
Blythe, CA	-8	78	Glasgow, MT	-5	50
Havre, MT	-7	48	Idaho Falls, ID	-5	50
Spokane, WA	-7	50	Quillayute, WA	-5	51
Cut Bank, MT	-6	45	Pocatello, ID	-5	52
Elko, NV	-6	50	Winnemucca, NV	-5	52
Yakima, WA	-6	53	Billings, MT	-5	52
Boise, ID	-6	55	Olympia, WA	-5	52
Cedar City, UT	-6	55	Seattle/Tacoma, WA	-5	54
Delta, UT	-6	56	Wenatchee, WA	-5	56
Las Vegas, NV	-6	72	Pendleton, OR	-5	57
Daggett, CA	-6	72	Albuquerque, NM	-5	63
Glendale/Luke AFB, AZ	-6	75	Paso Robles, CA	-5	64
Thermal, CA	-6	77	Bakersfield, CA	-5	71
Butte, MT	-5	44			

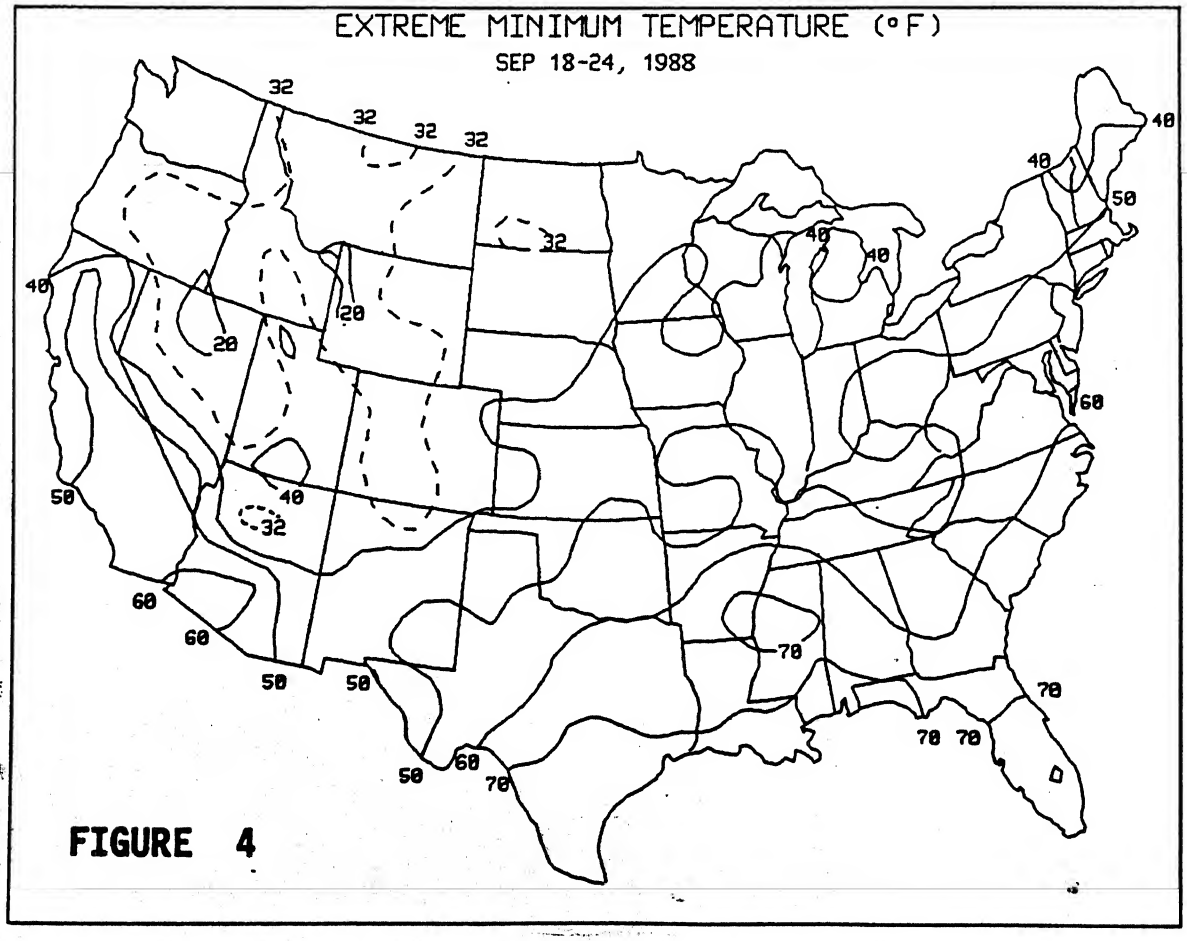
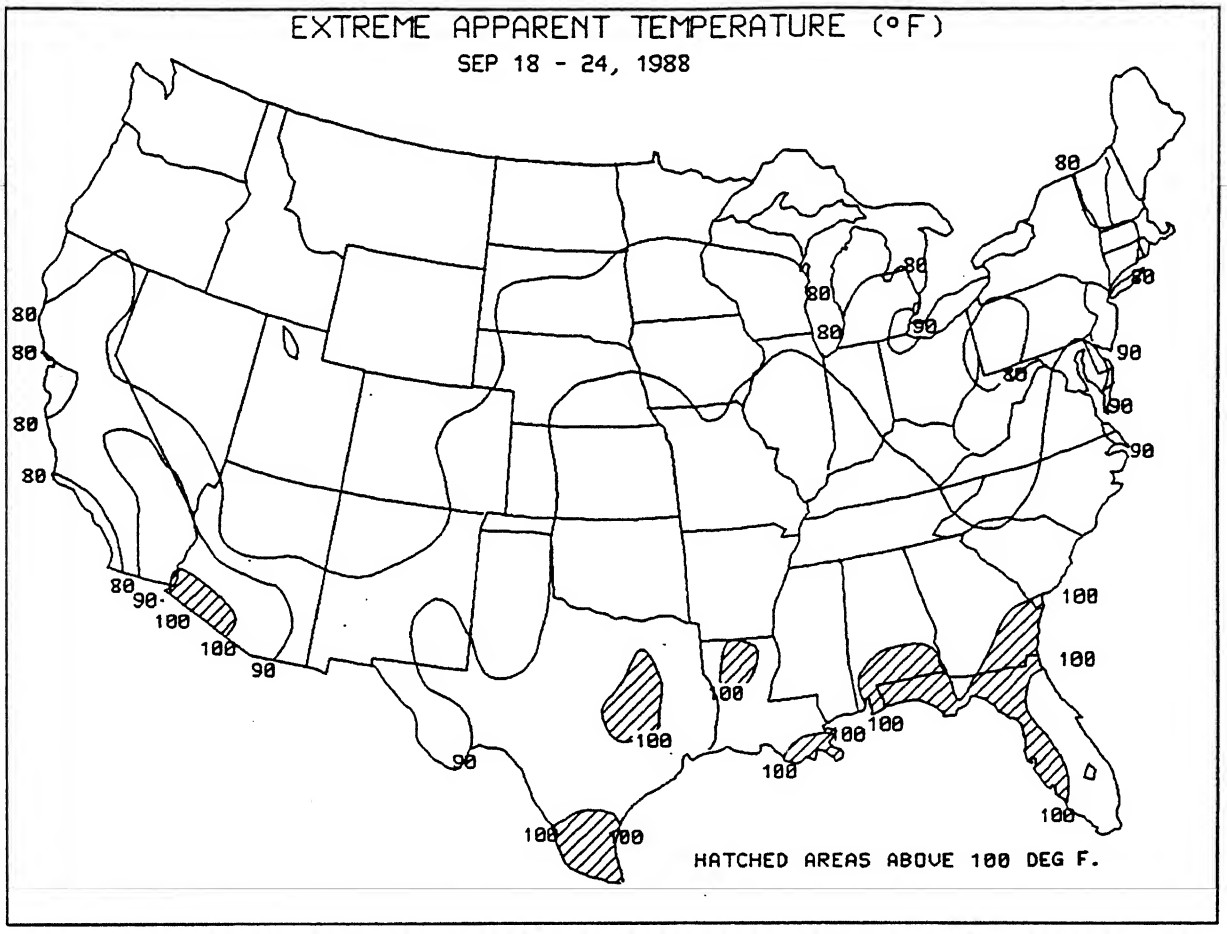
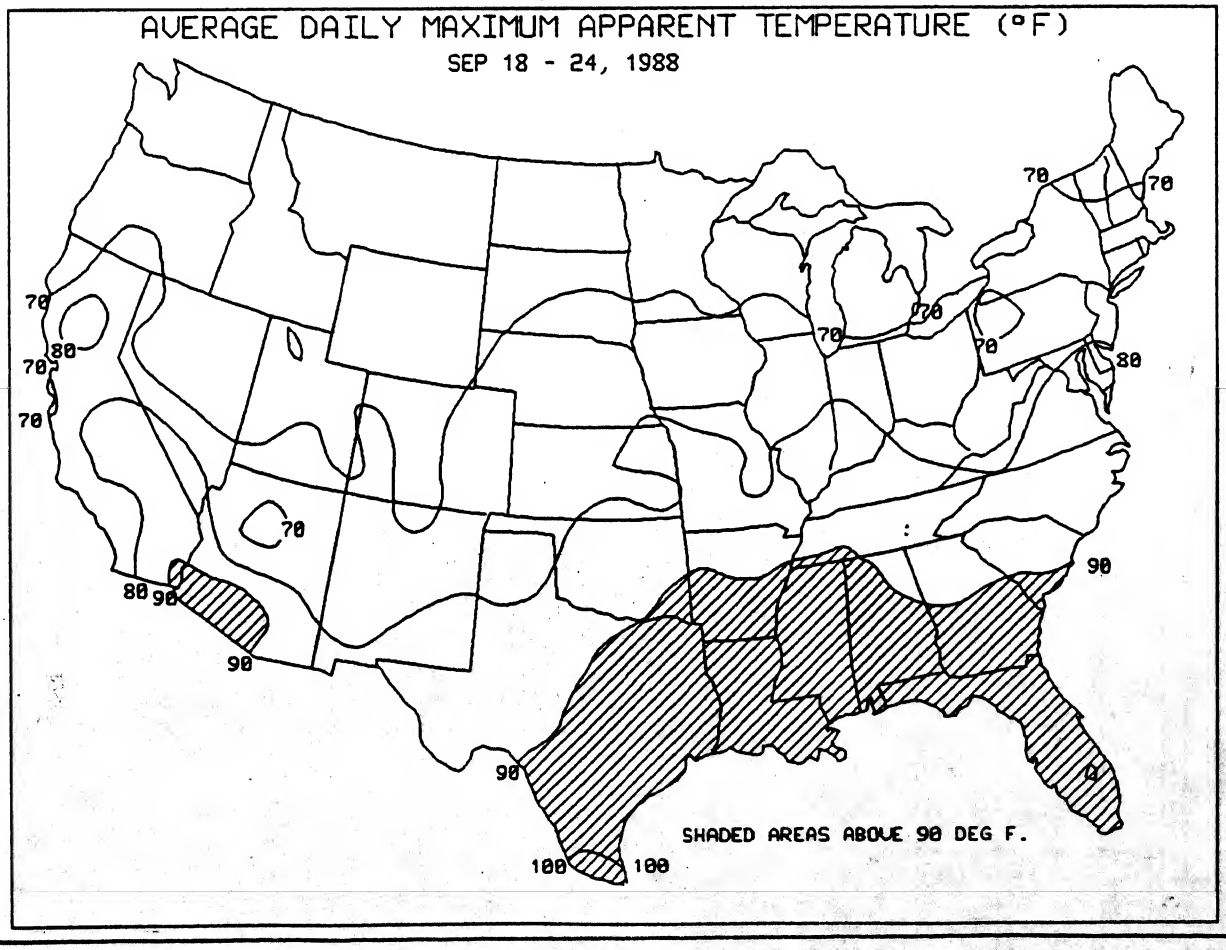


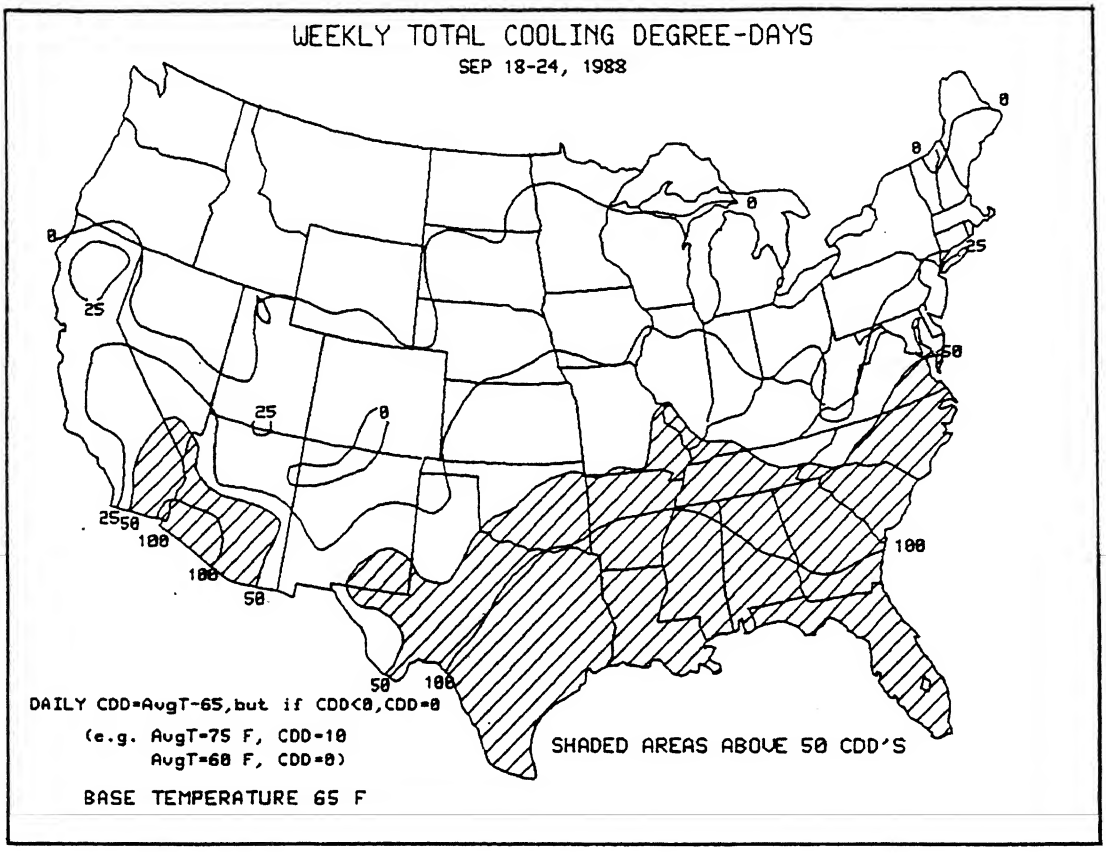
FIGURE 4

Unseasonably cold weather persisted in the western third of the nation as lows fell below freezing at least once last week and even dipped into the teens in parts of Nevada and Wyoming.

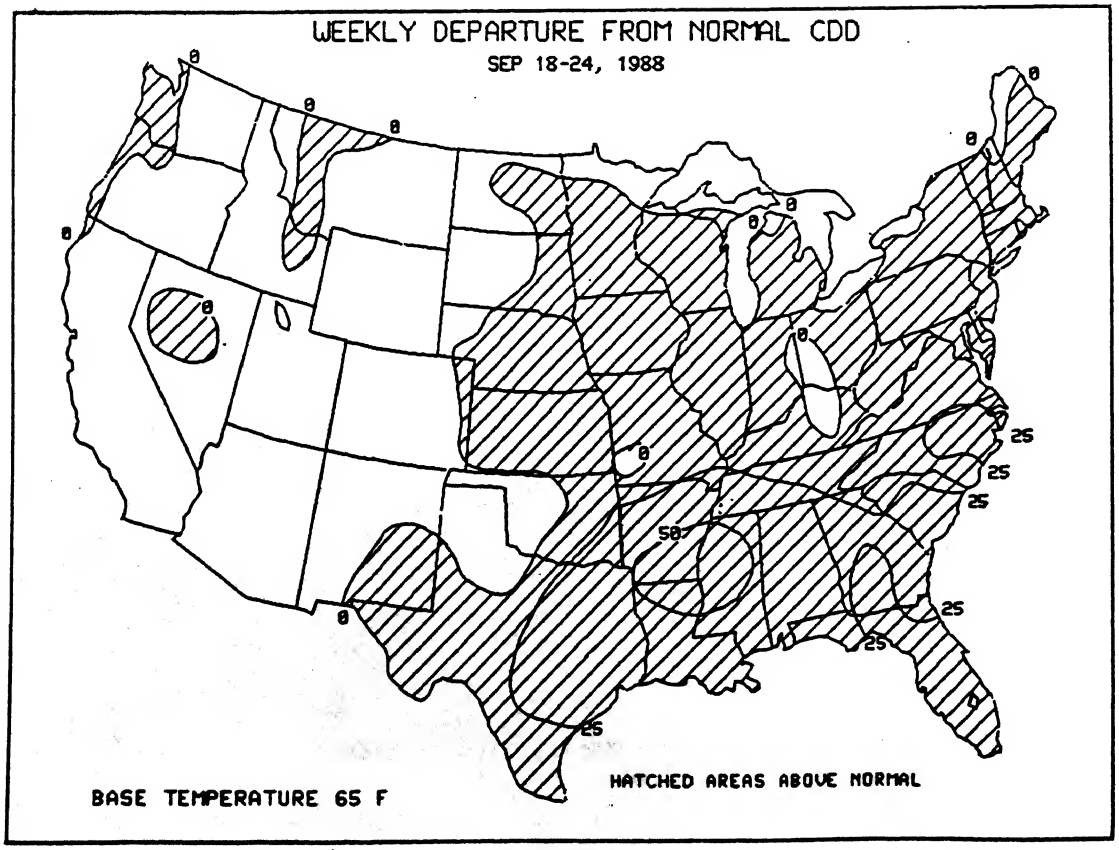


Apparent temperatures exceeded 100°F at least once along the Gulf Coast and in the desert Southwest (top), while uncomfortable (>90°F) average daily maximum apparent temperatures prevailed from Texas eastward to South Carolina (bottom).



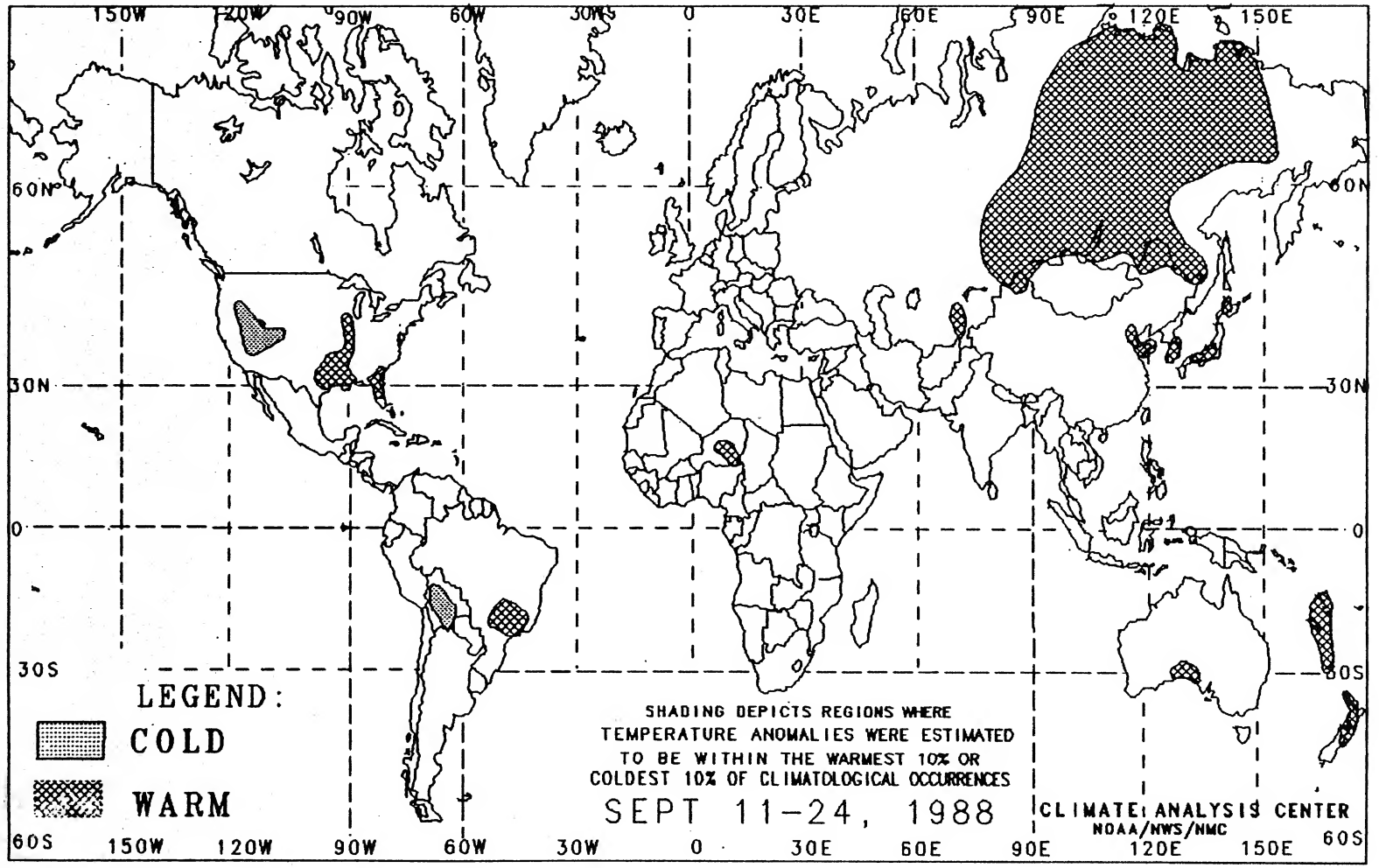


Largest air conditioning demand (>100 CDD) occurred in the South and the desert Southwest (top), while an above normal weekly demand for air conditioning was common throughout the eastern half of the U.S., especially in the lower Mississippi Valley (bottom).



GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

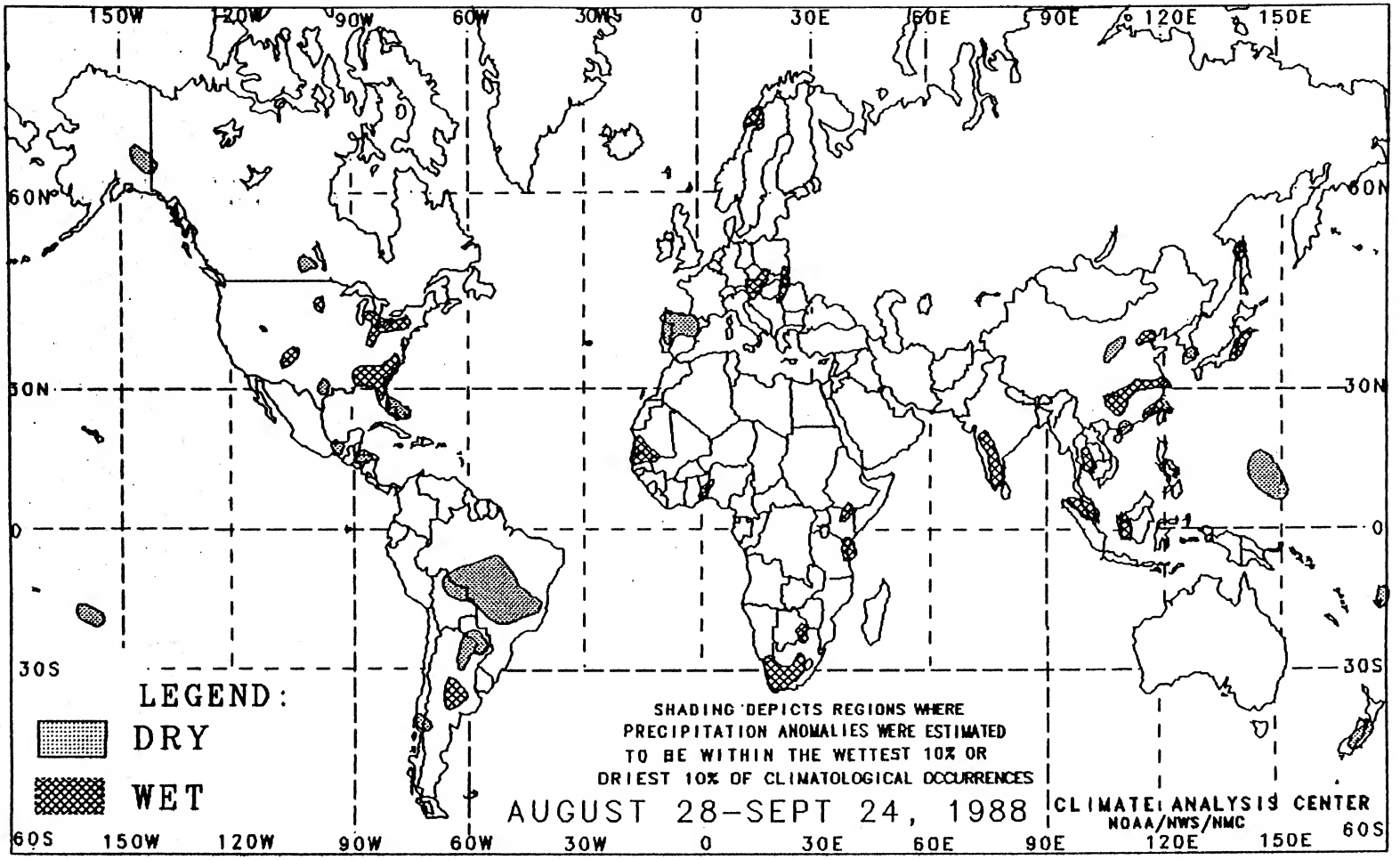
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data is insufficient for determining precentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



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The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data is insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

SPECIAL CLIMATE SUMMARY

Climate Analysis Center, NMC
National Weather Service, NOAA

HISTORICAL PERSPECTIVE ON THE APRIL-JUNE 1988 UNITED STATES CLIMATE DIVISION'S PRECIPITATION AND TEMPERATURE DATA DURING THE LAST 58 YEARS.

With the inclusion of the finalized U.S. monthly climate division data through June 1988 from the National Climatic Data Center (NCDC), updated versions of the April-June precipitation and temperature rankings for all 344 climate divisions in the contiguous United States were calculated (see front cover and Figure 2). In contrast to the preliminary monthly state climate division data, which incorporates data from only a few hundred first-order and airway stations, the finalized monthly climate division data contains additional information from much of the NCDC's Cooperative Observer Network (with over 10,000 stations).

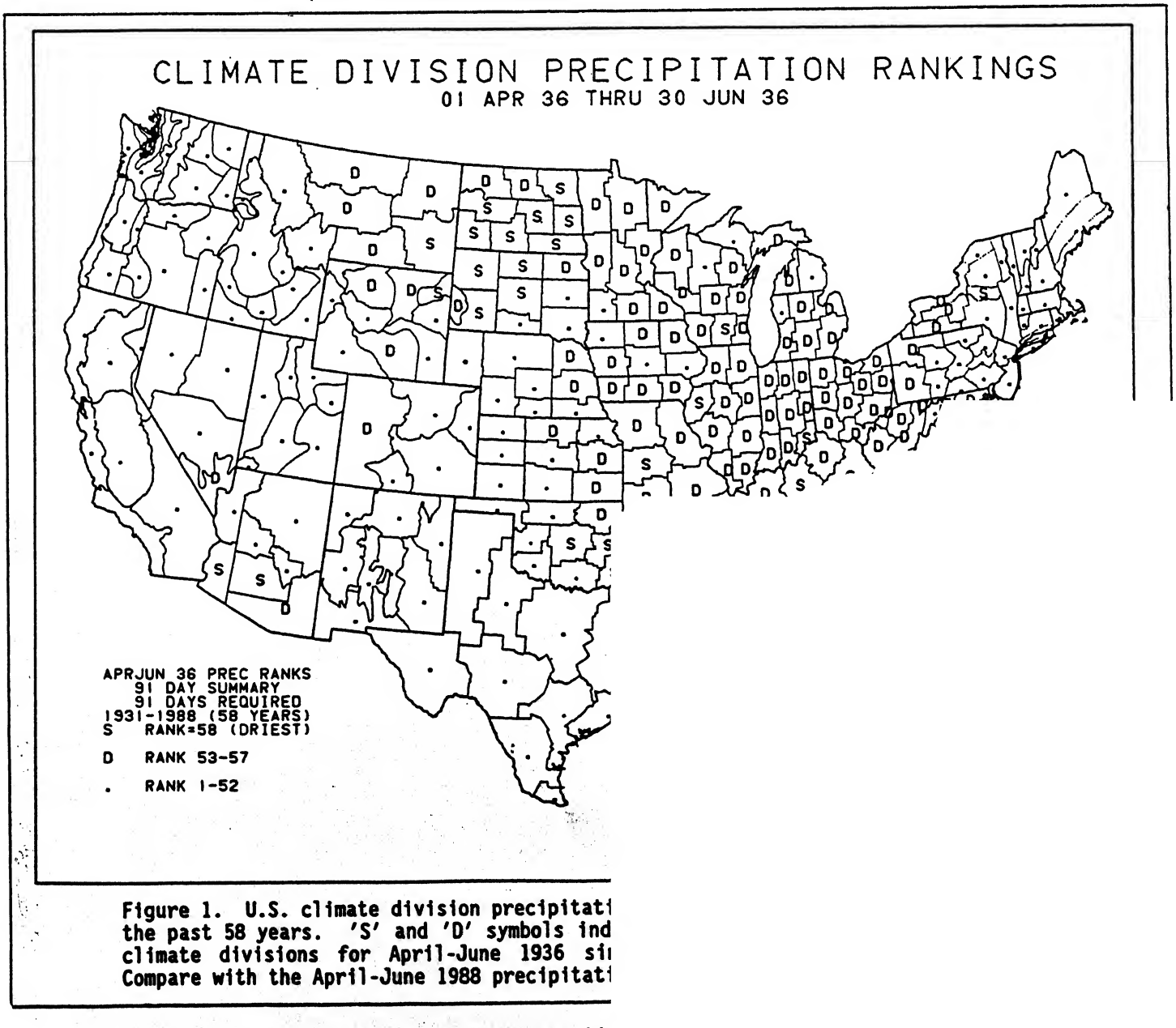

Figure 1. U.S. climate division precipitati the past 58 years. 'S' and 'D' symbols ind climate divisions for April-June 1936 si Compare with the April-June 1988 precipitati

This year's April-June precipitation amounts were the lowest recorded during the past 58 years (since 1931) for 62 climate divisions, a vast majority of them located in the Midwest and South. Furthermore, 104 other climate divisions, most notably in the northern Great Plains, Southeast, and central Appalachians experienced their second, third, fourth, or fifth driest April-June since 1931 (see front cover). In comparison to other extremely dry years, for example the "Dust Bowl" years of 1936 (see Figure 1) and 1934, there were 32 (114) and 21 (113) climate divisions that recorded their driest (second-fifth driest) April-June during 1931-1988, respectively.

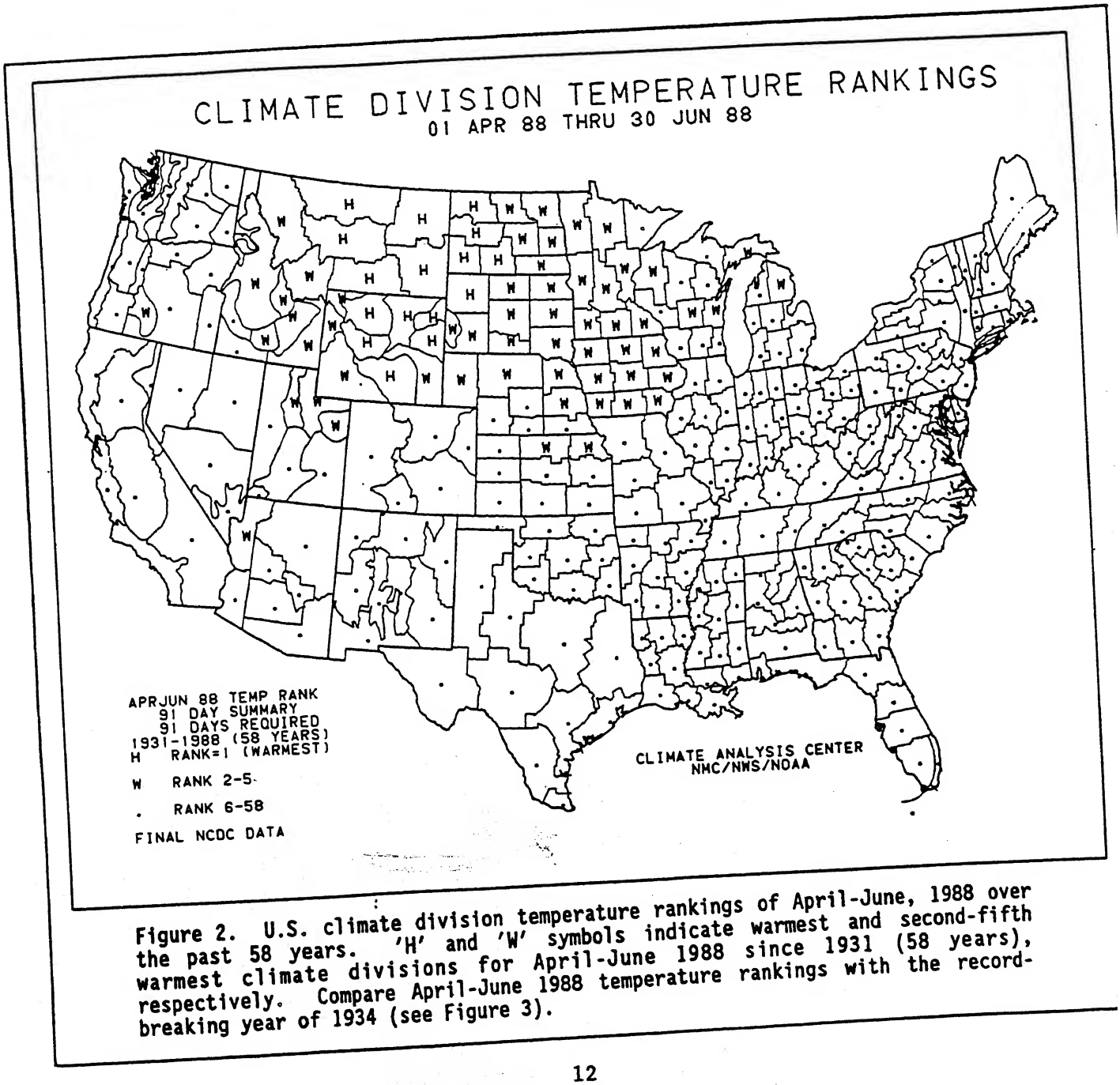

Figure 2. U.S. climate division temperature rankings of April-June, 1988 over the past 58 years. 'H' and 'W' symbols indicate warmest and second-fifth warmest climate divisions for April-June 1988 since 1931 (58 years), respectively. Compare April-June 1988 temperature rankings with the record-breaking year of 1934 (see Figure 3).

While the nation's midsection was experiencing extreme dryness during the late Spring and early Summer, near to record-breaking high temperatures were occurring in the northern Rockies, northern Great Plains, and upper Midwest (see Figure 2). Even though 16 (57) climate divisions observed their warmest (second-fifth warmest) April-June in 1988, overall conditions during April-June 1934 (see Figure 3) were more acute as 96 (117) climate divisions reported their warmest (second to fifth warmest) April-June during the past 58 years.

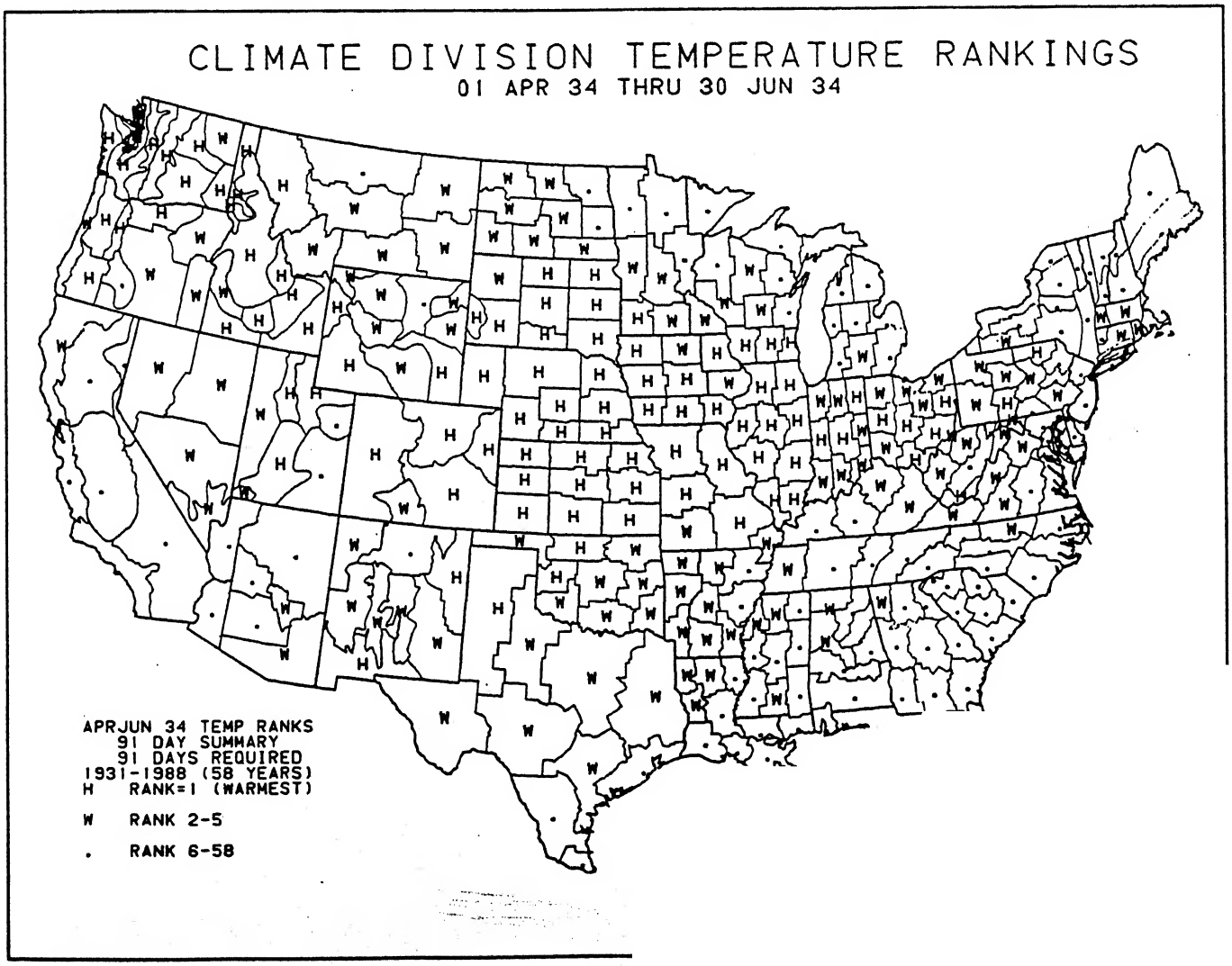

Figure 3. U.S. climate division temperat
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SPECIAL CLIMATE SUMMARY

Climate Analysis Center, NMC
National Weather Service, NOAA

MUCH OF THE CONTIGUOUS UNITED STATES HAS MEASURED BELOW NORMAL PRECIPITATION DURING THE PAST YEAR (SEPTEMBER, 1987 - AUGUST, 1988).

Since September 1, 1987 many areas of the United States have experienced abnormally dry conditions (see Figure 4). These regions include the Far West, especially California and Washington, the northern thirds of the Rockies and Great Plains, the Midwest, the Tennessee Valley and parts of the Southeast, and southeastern Texas as 12-month precipitation deficits ranged from 5-20 inches, 3-10 inches, 6-17 inches, 7-22 inches, and 10-22 inches, respectively (figure not shown). A large majority of the deficiencies accumulated during the normally peak precipitation months (e.g. December-March in the Far West, April-June in the northern Great Plains and Midwest). In contrast, above normal annual precipitation had fallen on the southwestern U.S. and on parts of the Appalachians, Gulf Coast, and middle Mississippi Valley.

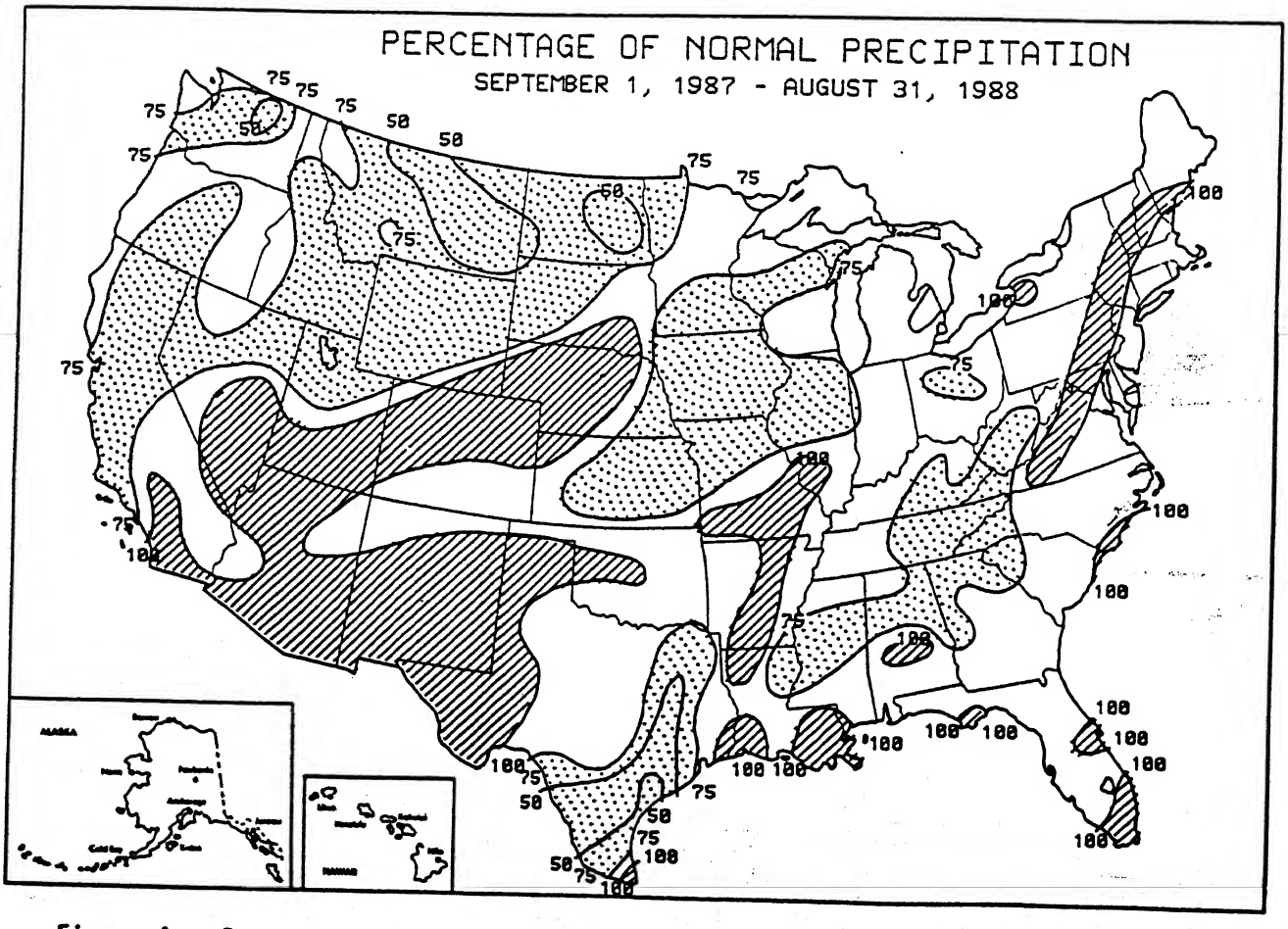

Figure 4. Percentage of normal precipitation during 9/1/87-8/31/88. Dotted regions less than 75%, and solid shaded areas more than 100%. Most of the contiguous U.S. has measured subnormal annual precipitation.